REMARKS

This Application has been carefully reviewed in light of the Final Office Action mailed March 17, 2009. At the time of the Final Office Action, Claims 1-20 were pending in this Application. Claims 1-20 were rejected. Applicants respectfully request reconsideration and favorable action in this case.

Rejections under 35 U.S.C. § 102

Claims 1-6 and 14-18 stand rejected by the Examiner under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,057,734 issued to Naoyuki Tsuzuki et al. ("*Tsuzuki*"). Applicants respectfully traverse and submit the cited art does not teach all of the elements of the claimed embodiment of the invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "the identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Applicants respectfully submit that the cited art as anticipated by the Examiner cannot anticipate the rejected Claims, because the cited art does not show all the elements of the present Claims.

Tsuzuki fails to teach all claim elements because it does not teach discharging in two stages. In particular, Claim 1 recites "dividing the ***discharging process*** into a ***first discharging duration***, during which a predetermined first amount of electrical energy is discharged from the piezo actuator, a ***subsequent holding time duration***, during which the piezo actuator is not controlled, and a ***subsequent second discharging duration***, during which a predetermined second amount of electrical energy is discharged from the piezo actuator." (Claim 1)(emphasis added). This discharging process serves to move "the valve element at a predeterminable point in time from a position in contact with the valve seat into a predetermined position away from the valve seat by a discharging process." (Claim 1). In other words, the vavle is being opened by the discharge proeess.

Alternatively, *Tsuzuki* diseloses elosing a valve by a two stage process.

> In FIG. 11, which illustrates a first embodiment of the apparatus for the driving a piezoelectric element according to the present invention, a first-stage ***charging*** condenser 104a and a second-stage ***charging*** condenser 104b are provided instead of the condenser 104 of FIG. 9, and thyristors 1051a and 1051b are provided in the ***charging*** switching circuit 105. Note that the voltage detecting circuit 108 monitors the voltage of the second-stage ***charging*** condenser 104b to define the operation of the high frequency oscillation circuit 1031.
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> In FIG. 11, since three thyristors, i.e., the first-stage ***valve closing*** thyristor 1051a, the second-stage ***valve closing*** thyristor 1051b, and the valve opening thyristor 1061, are present, a thyristor ignition circuit as illustrated in FIG. 13 is provided in the control circuit (microcomputer, not shown).

(*Tsuzuki* at 11:36-51) (emphasis added). Because *Tsuzuki* does not disclose "an auxiliary control chamber which is disconnected hydraulically from the outlet duct when the valve element is in contact with the valve seat and which otherwise is connected hydraulically to the outlet duct" (*see* FOA at 5), *Tsuzuki* does not disclose two stage discharging to open a valve. Thus, the invention as claimed in claim 1 is not anticipated by *Tsuzuki*. The invention as claimed in claims 3-5 is patentable for similar reasons.

Tsuzuki fails to teach all claim elements because it does not teach adapting a holding time. In particular, claim 1 recites "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, adapting the holding time duration and/or the first discharging duration in order to ensure precise control of the valve." Similarly, but relative to a charging process, claim 2 recites "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, adapting the holding time duration and/or the first charging duration in order to ensure precise control of the valve." Claim 14 recites, "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, means for adapting the holding time duration and/or the first charging duration in order to ensure precise control of the valve."

According to the specification,

> The holding time duration and/or the first discharging duration is/are adapted according to the waveform of a variable which is characteristic of the

> oscillation behavior of the piezo actuator during the holding time duration. By the means, pressure oscillations which occur as a result of the release of the valve seat in a fluid that is flowing through the valve can also easily be greatly dampened under different types of operating conditions of the valve. In addition, noise emissions can thus also be simply reduced.
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> The variable is preferably the amount of energy which is discharged from or fed to the piezo actuator, or the voltage which drops at the piezo actuator, or the current which flows through the piezo actuator, or the charge stored in it.

(Specification at ¶¶ 0009-0010). Alternatively, *Tsuzuki* teaches that the a predetermined time between the two charging stages. In particular, it teaches that "when a ***predetermined time such as 200 μs has passed***, so that the valve member 67d reaches the periphery of the valve seat 67b, the second-stage valve closing ignition signal S_1' is generated, to turn ON the thyristor 1051b." (*Tsuzuki* at 12:66-13:2). Because *Tsuzuki* fails to teach or suggest varying the time, the invention as claimed in claims 1, 2 and 14 is patentable in view of *Tsuzuki*. The invention as claimed in claims 3-6 and 15-18 is patentable for similar reasons.

Rejections under 35 U.S.C. §103

Claims 7-13 and 19-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tsuzuki* in view of U.S. Patent Application Publication No. 2002/0113139 by Nestor Rodriguez-Amaya et al. ("*Rodriguez-Amaya*"). Applicants respectfully traverse and submit the cited art combinations, even if proper, which Applicants do not concede, does not render the claimed embodiment of the invention obvious.

In order to establish a prima facie case of obviousness, the references cited by the Examiner must disclose all claimed limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Even if each limitation is disclosed in a combination of references, however, a claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). Rather, the Examiner must identify an apparent reason to combine the known elements in the fashion claimed. *Id.* "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.*, citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Finally, the reason must be free of the distortion caused by hindsight bias and may not rely on ex post reasoning. *KSR*, 127 S.Ct. at 1742. In addition, evidence that such a combination was uniquely challenging or difficult tends to show that a claim was not obvious. *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc. and Mattel, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007), citing *KSR*, 127 S.Ct. at 1741.

Tsuzuki fails to teach all claim elements of claims 7 and 8 because it does not teach discharging in two stages. In particular, Claim 1 recites "dividing the ***discharging process*** into a ***first discharging duration***, during which a predetermined first amount of electrical energy is discharged from the piezo actuator, a ***subsequent holding time duration***, during which the piezo actuator is not controlled, and a ***subsequent second discharging duration***, during which a predetermined second amount of electrical energy is discharged from the piezo actuator." (Claim 1)(emphasis added). This discharging process serves to move "the valve element at a predeterminable point in time from a position in contact with the valve seat into a predetermined position away from the valve seat by a discharging process." (Claim 1). In other words, the vavle is being opened by the discharge process.

Alternatively, *Tsuzuki* discloses closing a valve by a two stage process.

> In FIG. 11, which illustrates a first embodiment of the apparatus for the driving a piezoelectric element according to the present invention, a first-stage ***charging*** condenser 104a and a second-stage ***charging*** condenser 104b are provided instead of the condenser 104 of FIG. 9, and thyristors 1051a and 1051b are provided in the ***charging*** switching circuit 105. Note that the voltage detecting circuit 108 monitors the voltage of the second-stage ***charging*** condenser 104b to define the operation of the high frequency oscillation circuit 1031.
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> In FIG. 11, since three thyristors, i.e., the first-stage ***valve closing*** thyristor 1051a, the second-stage ***valve closing*** thyristor 1051b, and the valve opening thyristor 1061, are present, a thyristor ignition circuit as illustrated in FIG. 13 is provided in the control circuit (microcomputer, not shown).

(*Tsuzuki* at 11:36-51) (emphasis added). Because *Tsuzuki* does not disclose "an auxiliary control chamber which is disconnected hydraulically from the outlet duct when the valve element is in contact with the valve seat and which otherwise is connected hydraulically to the outlet duct" (*see* FOA at 5), *Tsuzuki* does not disclose two stage discharging to open a valve. *Rodriguez-Amaya* also does not teach this feature. Thus, the invention as claimed in claim 7 and 8 is not obvious in view of *Tsuzuki* and *Rodriguez-Amaya*.

Tsuzuki fails to teach all claim elements because it does not teach adapting a holding time. In particular, claim 1 recites "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, adapting the holding time duration and/or the first discharging duration in order to ensure precise control of the valve." Similarly, but relative to a charging process, claim 2 recites "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, adapting the holding time duration and/or the first charging duration in order to ensure precise control of the valve." Claim 14 recites, "dependent on the waveform of a voltage at the piezo actuator or a current through the piezo actuator which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration, means for adapting the holding time duration and/or the first charging duration in order to ensure precise control of the valve."

According to the specification,

> The holding time duration and/or the first discharging duration is/are adapted according to the waveform of a variable which is characteristic of the oscillation behavior of the piezo actuator during the holding time duration. By the means, pressure oscillations which occur as a result of the release of the valve seat in a fluid that is flowing through the valve can also easily be greatly dampened under different types of operating conditions of the valve. In addition, noise emissions can thus also be simply reduced.
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> The variable is preferably the amount of energy which is discharged from or fed to the piezo actuator, or the voltage which drops at the piezo actuator, or the current which flows through the piezo actuator, or the charge stored in it.

(Specification at ¶¶ 0009-0010). Alternatively, *Tsuzuki* teaches that the a predetermined time between the two charging stages. In particular, it teaches that "when a ***predetermined time such as 200 μs has passed***, so that the valve member 67d reaches the periphery of the valve seat 67b, the second-stage valve closing ignition signal S_1' is generated, to turn ON the thyristor 1051b." (*Tsuzuki* at 12:66-13:2). *Rodriguez-Amaya* also fails to teach this feature. Because *Tsuzuki* and *Rodriguez-Amaya* fail to teach or suggest varying the time, the invention as claimed in claims 1, 2 and 14 is patentable in view of

Tsuzuki and *Rodriguez-Amaya*. The invention as claimed in claims 7-13 and 19-20 is patentable for similar reasons.

Association of Customer Number and Change of Correspondence Address

Applicants respectfully request that all papers pertaining to the above-captioned patent application be associated with Customer No. **86528**, and direct all correspondence pertaining to this patent application to practitioners at Customer Number **86528**. All telephone calls should be directed to R. William Beard, Jr. at 512.457.2026. A Revocation and Power of Attorney will be filed shortly.

CONCLUSION

Applicants have made an earnest effort to place this case in condition for allowance in light of the remarks set forth above. Applicants respectfully request reconsideration of the pending claims.

Applicants believe there are no fees due at this time, however, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 50-4871 of King & Spalding L.L.P.

If there are any matters concerning this Application that may be cleared up in a telephone conversation, please contact Applicants' attorney at 512.457.2030.

Respectfully submitted,
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Date: June 17, 2009

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